



## **Rapid Ecological Assessment for the Western Prairie Ecological Landscape**

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### **An Inventory and Analysis of Rare Plants and Animals and High-quality Natural Communities in Support of a Master Plan**

Wisconsin's Natural Heritage Inventory Program  
Bureau of Natural Heritage Conservation  
Department of Natural Resources  
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**Primary Authors:** Ryan O'Connor, Rich Staffen, and Kevin Doyle

**Contributors:**

- Julie Bleser – data management
- Kevin Doyle – plant and natural community surveys, data processing, report writing assistance and review
- Terrell Hyde – data processing
- Ryan O'Connor – inventory coordination, report writing and coordination
- Rori Paloski – herptile surveys
- Amy Staffen – data processing, report review
- Richard Staffen – inventory coordination, bird surveys, herptile surveys, data processing, report writing assistance and review

**WDNR Reviewers:** Amy Staffen, Rich Staffen, Kevin Doyle, Jay Watson, Craig Anderson, Dean Edlin

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# Introduction

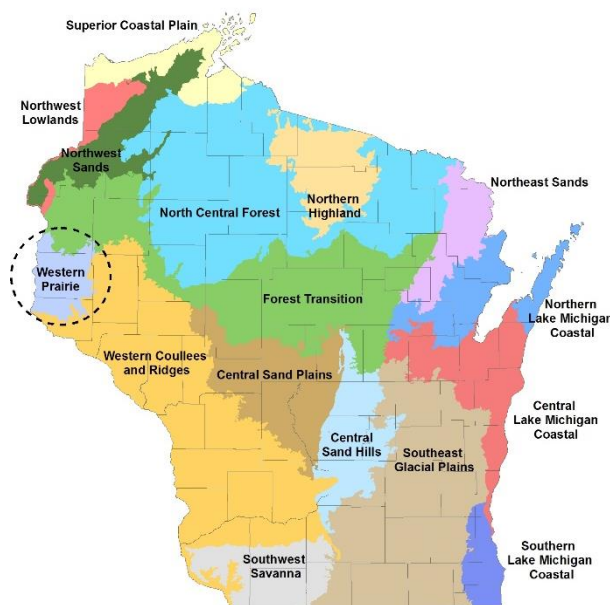
## Purpose and Objectives

This report is intended to be used as a source of information for developing the master plan for the Western Prairie Ecological Landscape (WP EL).

The primary objectives of this project were to collect biological inventory information relevant to the master plan for properties in the WP EL and to analyze, synthesize and interpret this information for use by the master planning team. This effort focused on assessing areas of documented or potential habitat for rare species and identifying natural community management opportunities.

Surveys for the WP EL were conducted in 2018 and focused on 1) identifying and evaluating ecologically important areas, including re-evaluating previously designated Primary Sites, 2) documenting or updating rare species occurrences, and 3) documenting or updating occurrences of high quality natural communities. This report serves as the “Biotic Inventory” document used for master planning. There will undoubtedly be gaps in our knowledge of the biota of this property, especially for certain taxa groups; these groups have been identified as representing either opportunities or needs for future work. Inventory data collected through this effort is a starting point for adaptive management of properties in the WP EL and should be revisited periodically and updated when new information becomes available.

This inventory was limited to properties being actively planned that had not previously been inventoried by the Wisconsin DNR’s Bureau of Natural Heritage Conservation (NHC) (Table 1).



**Map A.** Ecological Landscapes of Wisconsin.

**Table 1. Properties included in the Western Prairie EL rapid ecological assessment.**

Apple River Canyon SNA
Cylon Marsh Wildlife Area
Cylon Wildlife Area (including Cylon SNA)
Kinnickinnic River Fishery Area
Kinnickinnic State Park (including Kinnickinnic River Gorge SNA)
Osceola Hatchery (including Osceola Bedrock Glades SNA)
St. Croix Islands Wildlife Area (including St. Croix Islands SNA)
Upper Kinnickinnic Creek Streambank Protection Area (fee title only, including Kinnickinnic Wet Prairie SNA)
Western Prairie Habitat Restoration Area
Willow River State Park
Willow River Wildlife Area

## Overview of Methods

The Wisconsin Natural Heritage Inventory (NHI) program is part of the Wisconsin DNR's Bureau of Natural Heritage Conservation (NHC) and is a member of an international network of natural heritage programs representing all 50 states, as well as portions of Canada, Latin America, and the Caribbean. These programs share certain standardized methods for collecting, processing, and managing data for rare species and natural communities. NatureServe, an international non-profit organization (see [www.NatureServe.org](http://www.NatureServe.org) for more information), coordinates the network.

Natural heritage programs track certain elements of biological diversity: rare plants, rare animals, high-quality examples of natural communities, and other selected natural features. The NHI Working List (WDNR 2018) contains the elements tracked in Wisconsin. They include endangered, threatened, and special concern plants and animals, as well as the natural community types recognized by NHI. The NHI Working List is periodically updated to reflect new information about the rarity and distribution of the state's plants, animals, and natural communities. The most recent Working List is available from the Wisconsin DNR website (*Wisconsin Natural Heritage Working List*).

The Wisconsin NHI uses standard methods for biotic inventory to support master planning. Our general approach involves collecting relevant background information, planning and conducting surveys, compiling and analyzing data, mapping rare species and high quality natural community locations into the NHI database, identifying ecologically important areas, and providing interpretation of the findings through reports and other means.

Existing NHI data are often the starting point for conducting a biotic inventory to support master planning. NHC's biotic inventory projects typically start with a coarse-filter assessment, followed by targeted surveys for priority taxa, then data processing, analysis and report writing. Survey scope and intensity corresponds to the study area size and ecological complexity, as well as resource availability.

Taxa-specific field surveys for the WP EL were focused on documenting high quality natural communities, rare plants, breeding birds, and herptiles (Table 2). The collective results from these surveys were used, along with other information, to identify, evaluate, and update ecologically important areas (Primary Sites) of the WP EL.

**Table 2. Survey Targets and Methods for Biotic Inventory on the Western Prairie EL in 2018.**

Survey Target	Surveyors	Methods
Animals		
Breeding Birds	NHC Staff	Surveys followed Wisconsin Breeding Bird Atlas II protocols. Emphasis placed on areas not covered by Atlas blocks.
Herps	NHC Staff	Visual encounter searches for snakes and lizards.
Rare plants	NHC Staff	Meander surveys targeting prairies, savannas, wetlands, and forests.
Natural Communities	NHC Staff	Meander surveys focused on characteristic species, community boundaries, threats and management issues.

Survey locations were identified or guided by using recent aerial photos, USGS 7.5' topographic maps, various Geographic Information System (GIS) sources, information from past survey efforts, discussions with property managers, and the expertise of several biologists familiar with the properties or with similar

habitats in the region. Based on the location and ecological setting of properties within the WP EL, key inventory considerations included the identification of grasslands, savanna, sedge meadows, cliffs, upland forests, stream corridors, and the location of habitats that had the potential to support rare species. Private lands, including easements, were not surveyed.

Plant nomenclature follows the Wisconsin State Herbarium (WIS). Vertebrate animals follow standard common names.

For a description of the geology, historical vegetation, and current vegetation of the Western Prairie EL, please see Chapter 23 of the [Ecological Landscapes of Wisconsin](http://dnr.wi.gov) (dnr.wi.gov, keyword Ecological Landscapes).

# Management Considerations and Opportunities for Biodiversity Conservation

The Ecological Landscapes of Wisconsin highlights four major conservation and management opportunities for the Western Prairie Ecological Landscape (WDNR 2015a). These are summarized below, and a list of Primary Sites are presented under each item as examples. This list of sites is not meant to be exhaustive. Property planners and managers may identify important resources outside of primary sites by consulting the NHI Portal, NHI Biotic Inventory survey data or contractor reports, NHC District Ecologists, and other resources noted in the subsections below.

## Grasslands: Prairies, Surrogate Grasslands, Savannas

Grassland management represents the greatest opportunity for conservation in the WP EL. Though original unplowed prairie remnants are few, scattered, and small in the WP EL, extensive acreages of ‘surrogate’ grassland habitat are protected within the Western Prairie Habitat Restoration Area and scattered federal Waterfowl Protection Areas. The potential to provide substantially more grassland acres in this landscape make it one of the highest priority landscapes for grassland bird management in the state (Sample and Mossman 1997). Because of this, portions of the EL have been identified as a Grassland Bird Conservation Area (BCA), unique because this grassland landscape offers one of the few locations in the entire state with prairie potholes, more commonly found in Minnesota, Iowa, North Dakota, and South Dakota. These surrogate grasslands represent the best chances to maintain or increase habitat conditions required by other rare or declining grassland species as well, including small mammals and lepidopterans (butterflies and moths).

Remnant prairies of all types and sizes are also strong candidates for protection and management, including remnants on steep bluffs, within various rights-of-way, and even grazed but unplowed prairie pastures with restoration potential. Oak openings with restoration potential are also of conservation significance. Wherever possible, small sites containing examples of remnant grasslands and savannas should be incorporated into larger grassland management areas to accommodate additional aspects of function, composition, structure, and long-term viability. Properties inventoried in 2018 with good-quality examples of prairies, surrogate grasslands, and savannas include:

- Cylon Wildlife Area and SNA (see primary site description below)
- Kinnickinnic Wet Prairie SNA (see primary site description below)
- Manion Wildlife Area (see primary site description below)
- Willow River Wildlife Area (see Willow River – Three Lakes Grasslands primary site description below)

## Lower St. Croix River Valley

The Lower St. Croix River (from the dam at St. Croix Falls downstream to the St. Croix’s confluence with the Mississippi River) supports an exceptionally high diversity of aquatic organisms, including fish, mussels and other invertebrates, and including many rare species. Several mussels inhabiting this stretch of the St. Croix are globally rare. Small deltas have formed at the mouths of tributary streams, which provide important habitats for nesting turtles, and are used heavily by migrating and resident birds. Natural communities are also of conservation significance, and include an extensive matrix of emergent marsh, wet prairie, shrub-carr, and floodplain forest.

In much of the WP EL, the St. Croix is bordered by a corridor of heavily forested bluffs. Small prairie and savanna remnants are also present. This forested corridor is extensive and has a north-south orientation

making it a high use area by birds migrating to breeding grounds in forests to the north. It also hosts breeding populations of rare birds. Properties inventoried in 2018 with good-quality habitat along the Lower St. Croix include:

- St. Croix Islands Wildlife Area and SNA (see primary site description below)
- Apple River Canyon SNA (see primary site description below)

## **Kinnickinnic River Valley, Floodplain, and Adjoining Bluffs**

Below River Falls, the Kinnickinnic River flows freely through a valley that is bordered by dry-mesic to mesic hardwood forests and frequent exposures of dolomite and sandstone bedrock. In some locations, the bedrock outcrops form a deep, steep-sided gorge flanked by extensive series of cliffs. On the dry exposures the cliffs support species adapted to xeric site conditions and sparse vegetation; on shaded or moist sites, relicts of northern communities, including stands of coniferous trees and shrubs, may persist. In some areas along the lower river, the cliffs are moist due to groundwater seepage through fractures or pores in the bedrock and have high potential to support rare plants and animals. Small waterfalls are present in some of the short box canyons that are tributary to the Kinnickinnic River valley.

At scattered locations on the slopes and bluffs above the Kinnickinnic River, small prairie and savanna remnants occur. Rare plant populations have been documented at several of these prairie and savanna sites, some of which are most characteristic of grasslands in the northern Great Plains and reach their easternmost range in the WP EL. A property inventoried in 2018 with good-quality habitat in the lower Kinnickinnic River valley is:

- Kinnickinnic State Park and Kinnickinnic River Gorge and Delta SNA (see primary site description below)

## **Coldwater and Coolwater Streams**

Coldwater and coolwater streams support a distinct assemblage of aquatic organisms, and perhaps more importantly, ultimately contribute their clean, cool waters, directly or via tributaries, to either the St. Croix or Chippewa rivers. The St. Croix River is one of the most biologically diverse river systems in the Upper Midwest. Many coldwater streams in the southern third of the WP EL, such as the Kinnickinnic River, the upper reaches of the Rush, Trimble, and Eau Galle rivers, and the South Fork of the Willow River are of ecological significance because they have so far maintained their cold water community status in the face of major land use and land cover changes, and they are also likely to be more resilient in the face of climate change (Marshall et al. 2008).

Properties inventoried in 2018 with good examples of coldwater and coolwater streams include:

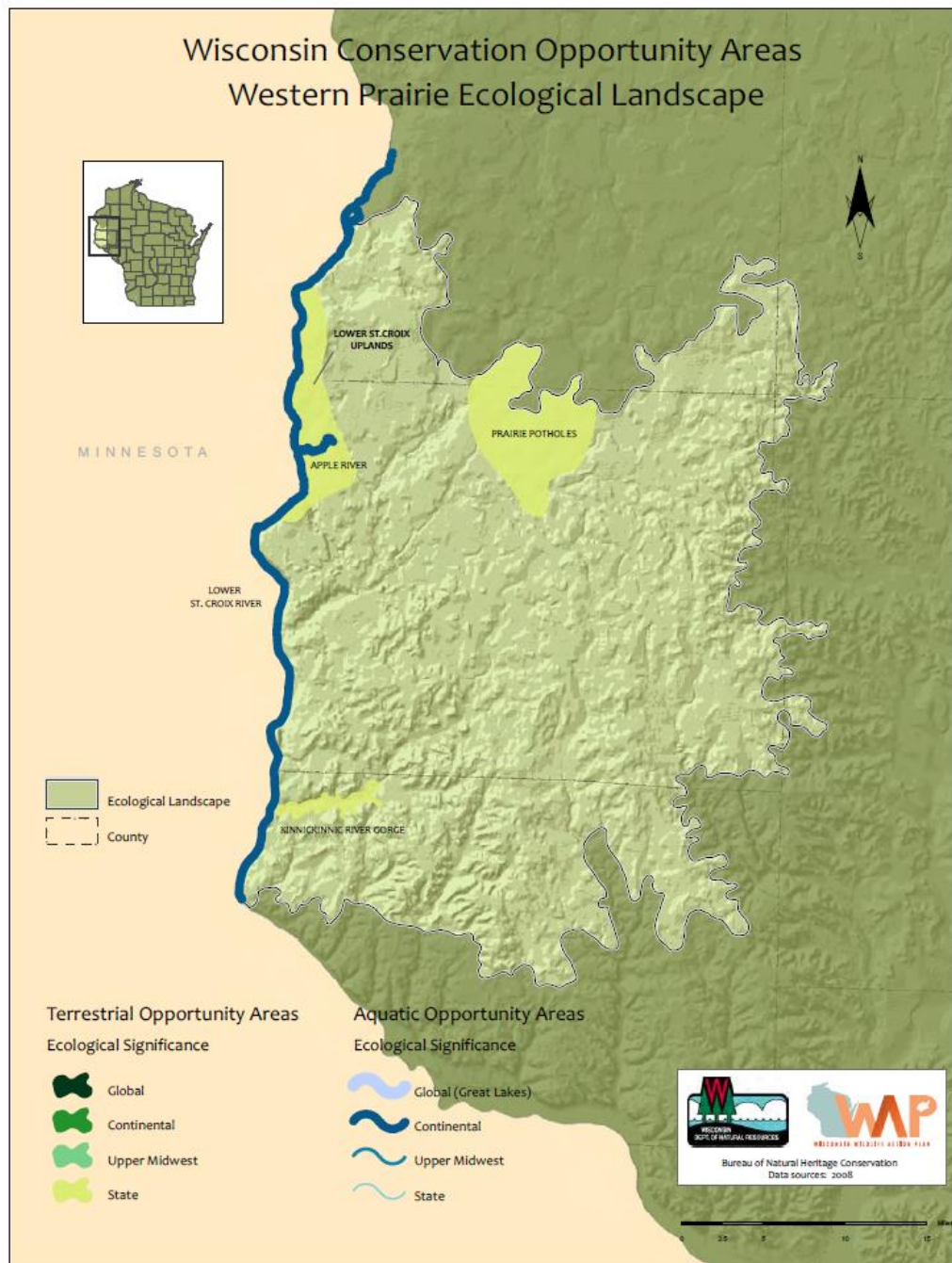
- Osceola Hatchery (see Osceola Bedrock Glade SNA, Springs, and Forest primary site description below)
- Kinnickinnic River State Park and Kinnickinnic River Gorge and Delta SNA (see primary site description below)



# Wildlife Action Plan Implementation and the Western Prairie Ecological Landscape

## Conservation Opportunity Areas

Conservation Opportunity Areas (COAs) are places in Wisconsin that contain ecological features, natural communities, or SGCN habitat that present the greatest likelihood of successfully implementing conservation actions when viewed from the global, continental, upper Midwest, or state perspective. Several COAs occur in the WP EL.



## Opportunities for Natural Community Conservation

Opportunities for sustaining natural communities in Ecological Landscapes were developed in 2005 by the Ecosystem Management Planning Team (EMPT, published in 2007) and later focused on wildlife Species of Greatest Conservation Need and their habitat in the Wisconsin Wildlife Action Plan (WDNR 2015b). The goal of sustaining natural communities is to manage for natural community types that 1) historically occurred in a given landscape and 2) have a high potential to maintain their characteristic composition, structure, and ecological function over a long period of time (e.g., 100 years). This list can help guide land and water management activities so that they are compatible with the local ecology of the Ecological Landscape while maintaining important components of ecological diversity and function. Based on EMPT's criteria, these are the most appropriate community types that could be considered for management activities within each Ecological Landscape.

The Wisconsin Wildlife Action Plan (WDNR 2015b) identifies 23 natural communities for which there are "High" or "Moderate" opportunities for protection, restoration, or management on the Western Prairie Ecological Landscape (Table 3). For information on conservation actions that are beneficial for these communities, please refer to the Wisconsin DNR website, keyword "Wildlife Action Plan".

**Table 3.** Natural Communities that occur on properties inventoried in 2018 with High or Moderate Opportunities for Protection, Restoration or Management in the Western Prairie Ecological Landscape (WDNR 2015b).

Community Type	
Bedrock Glade	Oak Opening
Coldwater streams	Riverine Mud Flat
Coolwater streams	Sand Prairie
Dry Cliff	Southern Dry-mesic Forest
Dry Prairie	Southern Mesic Forest
Dry-mesic Prairie	Spring Pond
Emergent Marsh	Springs and Spring Runs (Hard)
Floating-leaved Marsh	Submergent Marsh
Floodplain Forest	Surrogate Grasslands
Lacustrine Mud Flat	Warmwater Rivers
Mesic Prairie	Warmwater Streams
Moist Cliff	

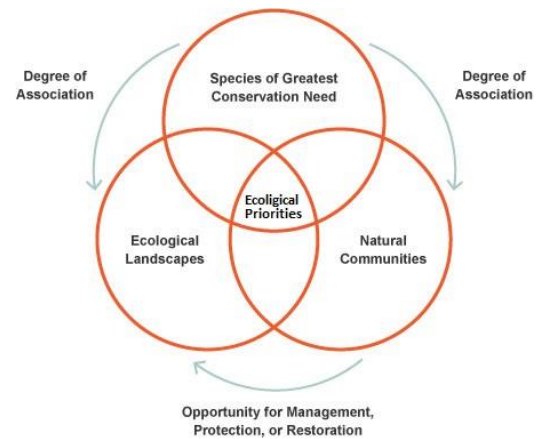
## Opportunities to Conserve Species of Greatest Conservation Need (SGCN) and Rare Plants

The Wisconsin Wildlife Action Plan also notes Species of Greatest Conservation Need (SGCN; WDNR 2015b) associated with each Ecological Landscape. Species of Greatest Conservation Need are animals that have low and/or declining populations that need conservation action. They include various birds, fish, mammals, reptiles, amphibians, and invertebrates (e.g., dragonflies, butterflies, and freshwater mussels) that:

- Are already listed as threatened or endangered;
- Have few, low, or declining populations, and/or threats their populations or habitats;
- Are stable in number in Wisconsin, but declining in adjacent states or nationally;
- Have biological, genetic or ecological characteristics that place them at risk or make them vulnerable to decline.

There are 79 SGCN and 18 rare plants highly or moderately associated with the Western Prairie Ecological Landscape. This means that these species are significantly associated with the EL, and that restoration of natural communities with which these species are associated would significantly improve their conditions.

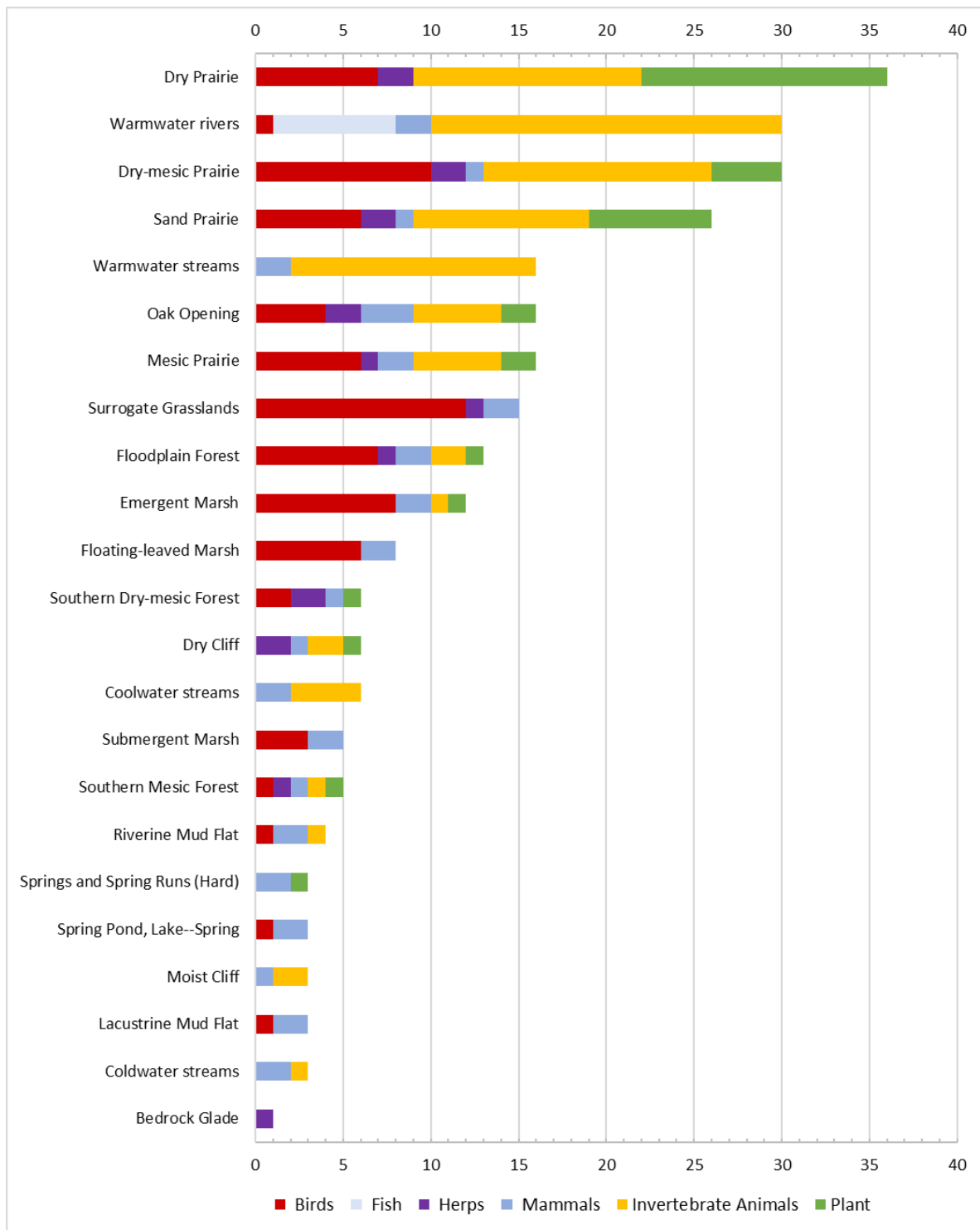
The Wisconsin Wildlife Action Plan also identifies ecological priorities for conservation by highlighting the natural communities in each Ecological Landscape that are most important to the SGCN (Figure 1). While many communities that occur on the WP EL have major or important conservation opportunities, some of these communities support more SGCN and rare plant species than others (Figure 2). For example, dry prairie, oak openings, and surrogate grassland support a significant number of rare species in the WP EL. Although all of these rare species do not necessarily occur on DNR properties, natural communities with higher species counts provide a disproportionate benefit to a greater number of SGCN and rare plants across the WP EL and may warrant special consideration in the master planning process. This intersection of SGCN and rare plants with priority natural communities represents the best opportunities for management on the WP EL from an ecological and biodiversity perspective. For a complete list of which SGCN are associated with the WP EL, please see the Wisconsin Wildlife Action Plan website (<https://dnr.wi.gov/>, keyword "Wildlife Action Plan"), or for species associated with specific natural communities, see the natural community pages (<https://dnr.wi.gov/>, keyword "Natural Communities").



**Figure 1.** Diagram of ecological priorities based on the Wildlife Action Plan.

Taxa and species-specific conservation opportunities in the WP EL include:

- The lower St. Croix River is one of the most important rivers for rare mussels in Wisconsin and perhaps in the Upper Midwest. It is highly significant to other aquatic organisms as well, including at least 26 rare species of fish, mussels, and other invertebrates. Diverse habitats, river size, and good water quality are key factors accounting for the presence of these rare species.
- The WP EL is the only place in the state where it may be possible to maintain and manage a prairie-pothole complex for birds. It is important to maintain populations of the many declining species of grassland and wetland birds that use these habitats. Grassland bird species with a limited state range but that nest in the WP EL include the western meadowlark, Henslow's sparrow, Bell's vireo, and loggerhead shrike, as well as other more widespread grassland birds.
- Floodplain forests along the St. Croix support important breeding populations of rare species such as bald eagle, red-shouldered hawk, prothonotary warbler and Louisiana waterthrush.
- The Willow River and its tributary Ten-mile Creek support the only known populations of the Wisconsin Special Concern sand snaketail dragonfly in the WP EL. The sand snaketail requires a substrate of coarse sand to fine gravel.
- This ecological landscape is important for conserving and managing the Wisconsin Threatened gilt darter, which is sensitive to water pollution and siltation.
- The WP EL is important for numerous rare plants associated with prairies and oak openings such as Louisiana broomrape (*Orobanche ludoviciana*), ground-plum (*Astragalus crassicaarpus*), dotted blazing star (*Liatris punctata* var. *nebraskana*), prairie ragwort (*Packera plattensis*), Carolina anemone (*Anemone caroliniana*), prairie turnip (*Pedimelum esculentum*), yellow evening primrose (*Calylophus serrulata*), silky prairie clover (*Dalea villosa*) and kitten-tails (*Besseyia bullii*). Several of these occur more commonly in the Great Plains to the west and their presence in Wisconsin is almost exclusively limited to the WP EL, such as the dotted blazing star.



**Figure 2.** Number of SGCN and Rare Plants Highly or Moderately Associated with Natural Communities that have High or Moderate Opportunities for Protection, Restoration or Management in the Western Prairie Ecological Landscape.<sup>1</sup>

<sup>1</sup> Figure represents the SGCN and rare plants that are moderately or highly associated with the respective natural communities. Species and natural communities represented are limited to those that are moderately to highly associated with the Western Prairie Ecological Landscape.

# Primary Sites: Site-specific Opportunities for Biodiversity Conservation

Seven ecologically important sites were identified on the Western Prairie Ecological Landscape during surveys in 2018. These “Primary Sites” were delineated because they generally encompass the best examples of:

- 1) Rare and representative natural communities,
- 2) Documented occurrences of rare species populations, and/or
- 3) Opportunities for ecological restoration or connections.

**Table 4.** Western Prairie Ecological Landscape Rapid Ecological Assessment Primary Sites based on 2018 surveys.

Code	Primary Site Name
WPEL01	Cylon State Natural Area
WPEL02	Kinnickinnic River Gorge and Delta SNA
WPEL03	Kinnickinnic Wet Prairie SNA
WPEL04	Manion Wildlife Area Prairie
WPEL05	Willow River – Three Lakes Grasslands
WPEL06	St. Croix Islands SNA and Floodplain
WPEL07	Apple River Canyon SNA
WPEL08	Osceola Bedrock Glades SNA, Springs, and Forest

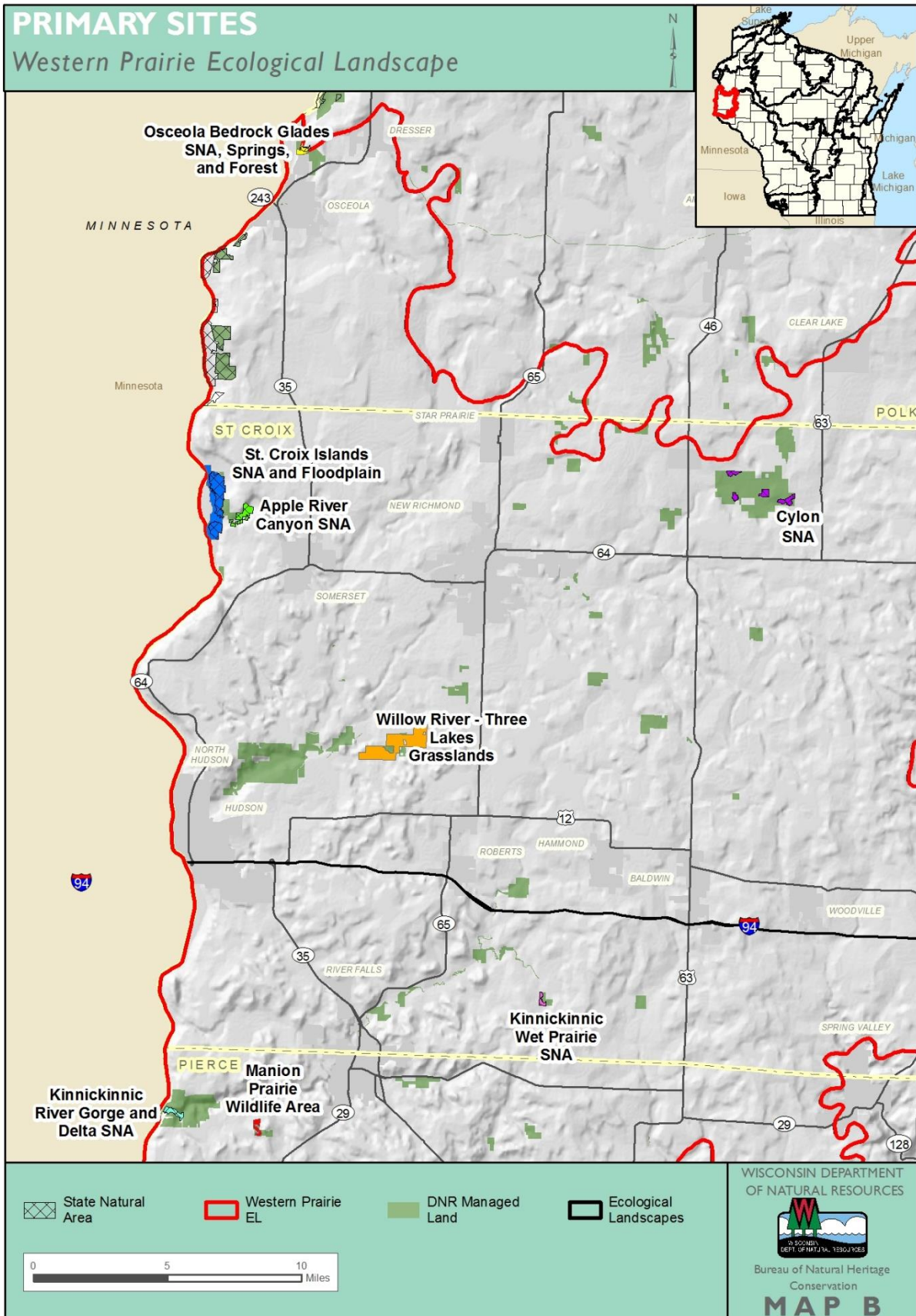
These sites warrant high protection and/or restoration consideration during the development of the property master plan. This report is meant to be considered along with other information when identifying opportunities for various management designations during the master planning process.

Primary Sites are also considered High Conservation Value Forests (HCVFs) for the purposes of Forest Certification, which requires the identification and periodic monitoring of HCVFs. All DNR-managed lands, including state forests, parks, wildlife and fishery areas, and natural areas are certified. Certified forests are recognized by the Forest Stewardship Council (FSC) and the Sustainable Forestry Initiative (SFI) as being responsibly managed (Forest Stewardship Council 2009).

Information provided in the summary paragraphs below includes location information, a site map, summary of the natural features present, important plant and animal species, the site’s ecological significance, and management considerations.

No other biotic inventory reports or rapid ecological assessments have been conducted in the WP EL and this list represents the complete list of primary sites in this ecological landscape at this time.





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## WPEL01. CYLON SNA

### **Location**

Property: Cylon Wildlife Area  
Landtype Association: Deer Park Prairie (222Md08)  
Approximate Size: 207 acres

### **Description of Site**

[Cylon SNA](#) is made up of four separate units within Cylon Wildlife Area and is located on nearly level topography scattered along the Willow River. It features forests and sedge meadows with an interesting mix of both northern and southern plant species. The closed canopy forest is composed of large Hill's oak, white oak, and bur oak with basswood, red maple, and white pine. Red maple and American elm are common in the sapling layer. Ironwood dominates the sub-canopy layer and hazelnut and blackberry occur in the shrub layer. Ground flora includes such species as sweet cicely, tick-trefoil, enchanter's nightshade, black snakeroot, large-flowered trillium, maidenhair fern, wild strawberry, Canada mayflower, and partridgeberry. The sedge meadow is comprised of wire-leaved sedges mixed with white meadowsweet and steeplebush.

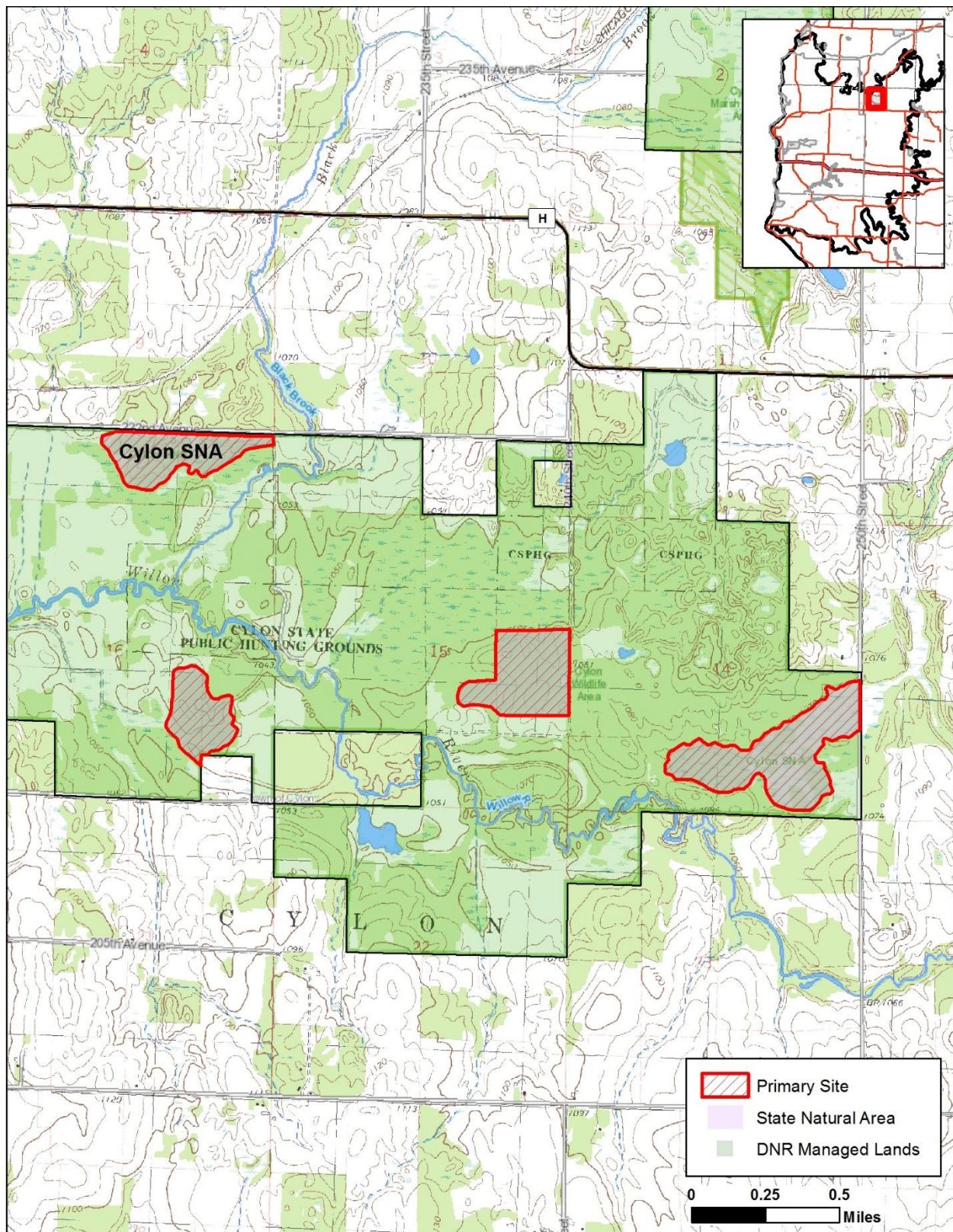
### **Significance of Site**

This site encompasses good-quality forest and sedge meadow and supports several rare species, including a bird, reptile, and plant. Birds using the area include trumpeter swan, wood duck, blue-winged teal, ruffed grouse, broad-winged hawk, northern harrier, common nighthawk, ovenbird, brown thrasher, and wood thrush. Cylon was designated a State Natural Area in 2010 and represents some of the highest quality areas within Cylon Wildlife Area, one of the largest remaining tracts of natural habitat remaining in the Western Prairie Ecological Landscape. It is located just east of the Prairie Potholes Conservation Opportunity Area, a COA of state significance for its surrogate grasslands, pothole lakes and oak openings (WDNR 2008).

### **Management Considerations**

Cylon SNA and Cylon Wildlife Area are managed with the objectives of restoring temporary and seasonal wetlands, protection of the ecological gradient from lowlands to uplands, and control of invasive species. Common buckthorn is the most concerning threat within the SNA. Currently the species is only occasional at the site and should be controlled before it becomes a more widespread problem. Oak and pine regeneration is limited or absent from many of the southern dry-mesic forests. Thinning and prescribed fire could be used to open the canopy and promote these characteristic species. Much of the site shows signs of earthworm invasion. Although there aren't many options for removing existing earthworm populations, increasing awareness about the impact they can have on forest health may prevent their spread.





**WPEL01. Cylon SNA Primary Site**



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## WPEL02. KINNICKINNIC RIVER GORGE AND DELTA SNA

### **Location**

Property: Kinnickinnic State Park  
Landtype Association: St. Croix Prairie (222Md06)  
Approximate Size: 88 acres

### **Description of Site**

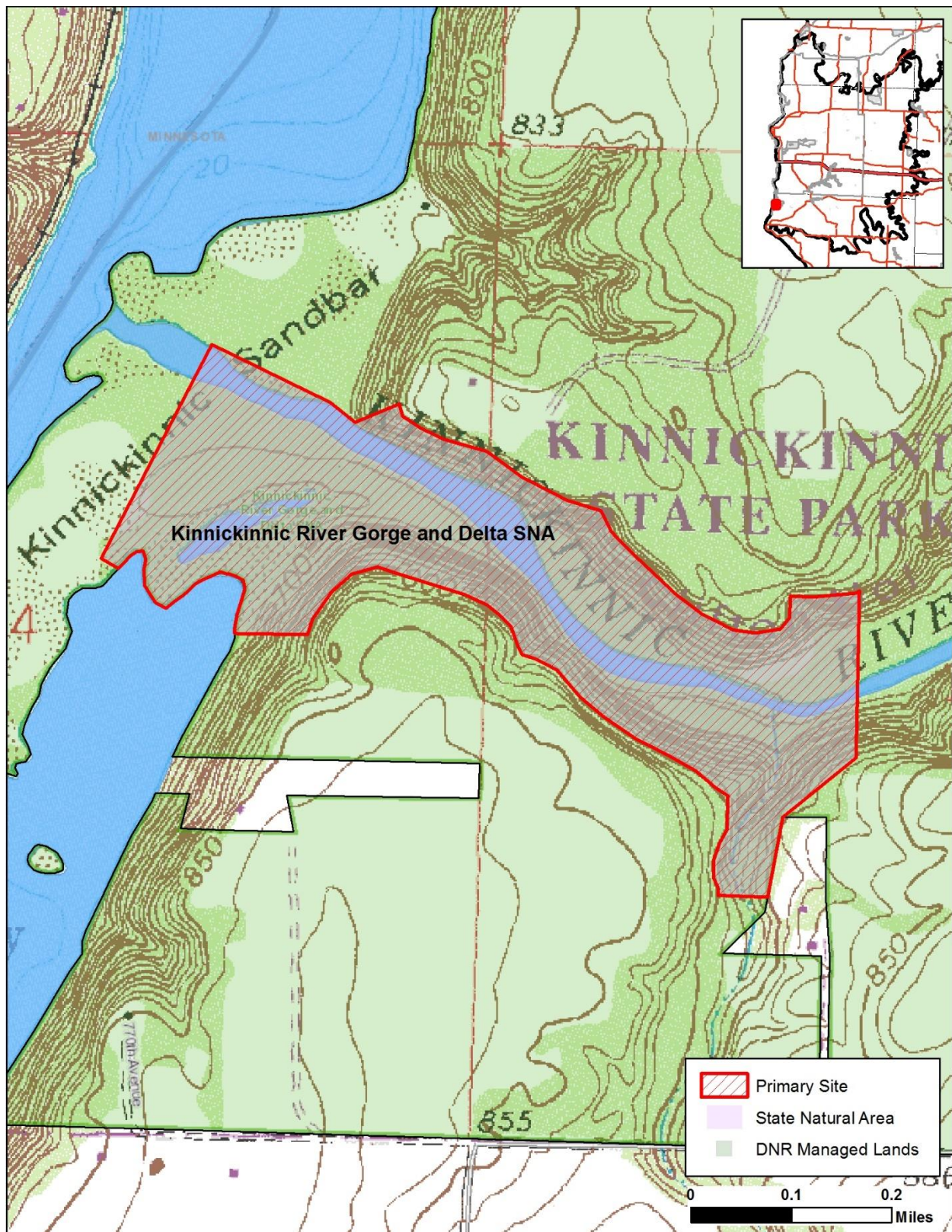
[Kinnickinnic River Gorge and Delta SNA](#) contains an undisturbed river gorge with a diversity of plant communities and features one of the finest examples of river delta in Wisconsin. The deep river valley, cut into glacial drift, sandstone, and limestone, contains dry-mesic forest on the sheltered north-facing slope and xeric oak-cedar woods and small prairie openings on the exposed south-facing slope. The steep south bank contains large beds of Canada yew and walking fern under a forest of sugar maple, ironwood, and white pine. The steep, thin-soiled slope contains hepatica, common polypody fern, walking fern and other mesic woodland plants. Dripping to dry cliffs are found intermittently throughout the valley. On the south side of the river is the Devil's Mixing Bowl - a series of cascades originating in a deep box canyon and emptying into a small pool. A spectacular example of dripping cliffs is found within this canyon. At the head of the canyon the sheer walls support a ribbon of bulblet ferns growing along a high shelf. From this shelf, water falls 10 feet to the canyon floor and down the cascades. The lower waterfall is dry except in wet seasons. Numerous mosses and lichens blanket the canyon floor.

### **Significance of Site**

This site comprises the Kinnickinnic River Gorge Conservation Opportunity Area, a COA of statewide significance featuring riparian communities and the adjacent uplands containing floodplain forest, dry prairie, oak opening, dry cliff and moist cliff (WDNR 2008). Of special geomorphologic interest is the large semi-open delta deposited by the Kinnickinnic River as it flows into the St. Croix River; this stretch of the St. Croix is also designated as a Portfolio Lake by The Nature Conservancy (Blann and Wagner 2014). The delta and river lowlands are used by waterfowl. The St. Croix River also contains numerous rare fish and mussels. Relicts of northern communities and some rare plants are associated with the moist cliffs of the gorge. A rare raptor was also documented from forested areas of the site in the 1970s and several waterbirds (egrets, herons) utilize the area for foraging and potentially nesting. The dry prairie openings above the gorge support a large population of a rare plant and the north-facing slopes support an excellent population of the uncommon Canada yew. Kinnickinnic River Gorge and Delta was designated a State Natural Area in 1980.

### **Management Considerations**

Site objectives are to manage the site as a reserve for dry prairie and shaded cliff, as a significant geological feature, and as an ecological reference area. Natural processes and prescribed fire will determine the structure of the prairie and associated gorge and cliff communities. The ecological characteristics of the native prairie will be primarily shaped by a fire management program. The native prairie species should be managed actively through tree/shrub control using tree harvest, brushing and especially fire to mimic natural disturbance patterns. Occasional fire-tolerant oaks, hickories, and native shrubs such as hazelnut may be retained at low densities. The native dominant tree species in the gorge are managed passively. However, some thinning of the canopy, understory manipulation and shrub control via harvest, brushing or fire may be needed to mimic natural disturbance patterns. Other allowable activities include control of invasive plants and animals, augmentation of native prairie species after careful review, maintenance of existing facilities, access to suppress wildfires, and salvage of trees after a major wind event. Litter deposited by boat users of the delta beaches is a constant management problem.



**WP02. Kinnickinnic River Gorge and Delta SNA Primary Site**

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## WPEL03. KINNICKINNIC WET PRAIRIE SNA

### ***Location***

Property: Upper Kinnickinnic Creek Streambank Protection Area  
Landtype Association: Baldwin Moraines (222Md11)  
Approximate Size: 45 acres

### ***Description of Site***

[Kinnickinnic Wet Prairie SNA](#) supports many native prairie plants that have persisted despite having been grazed in the past. Most of the surviving species are characteristic wet prairie indicators with the majority being forbs that survived years of grazing pressure. Numerous springs and seeps are also present. These provided a barrier to the cattle and may have served to protect the prairie. Sedge meadow and cattail marsh surround the prairie and contain less conservative species but are none-the-less high-quality examples of these natural community types. Several seeps and springs flow into Parker Creek, a tributary of the Kinnickinnic River.

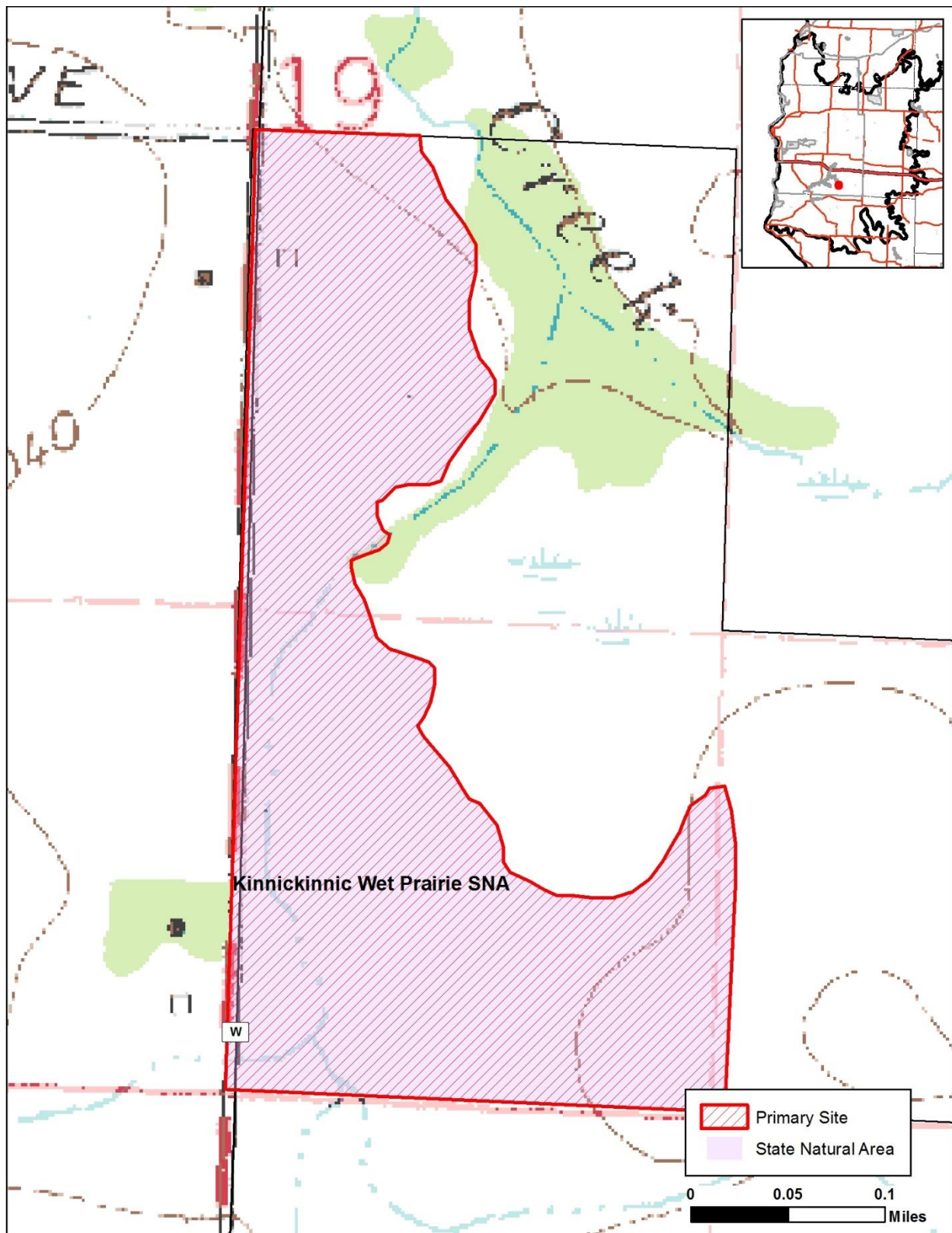
### ***Significance of Site***

Wet prairies were once common throughout the Western Prairie Ecological Landscape, but virtually no high-quality examples remain today. Given the high number of wet prairie indicator species growing on saturated mineral soils here, this site represents the best candidate for wet prairie restoration in the ecological landscape. Kinnickinnic Wet Prairie was designated a State Natural Area in 2008. The site is located with the Western Prairie Bird Conservation Area and rare grassland birds have been documented adjacent to the property.

### ***Management Considerations***

The objectives of the site are to manage the site as a wet prairie restoration site and a wetland protection area. Natural processes and prescribed fire will determine the structure of the prairie and associated wetlands. The existing native wet prairie forbs form the basis for a wet prairie restoration. Active interseeding of grasses and other species will be needed to restore species composition. Some tree and shrub control via brushing or fire may be needed to mimic natural disturbance patterns. Occasional native fire-tolerant shrubs may be retained at low densities. Other allowable activities include control of invasive plants and animals, augmentation of native prairie species after careful review, maintenance of existing facilities, and access to suppress wildfires. In addition, a roadside easement area may be managed sporadically by township.





**WPEL03. Kinnickinnic Wet Prairie SNA Primary Site**

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## WPEL04. MANION WILDLIFE AREA PRAIRIE

### **Location**

Property:	Manion Wildlife Area
Landtype Association:	River Falls Eroded Moraines (222Md10) and St. Croix Prairie (222Md06)
Approximate Size:	69 acres

### **Description of Site**

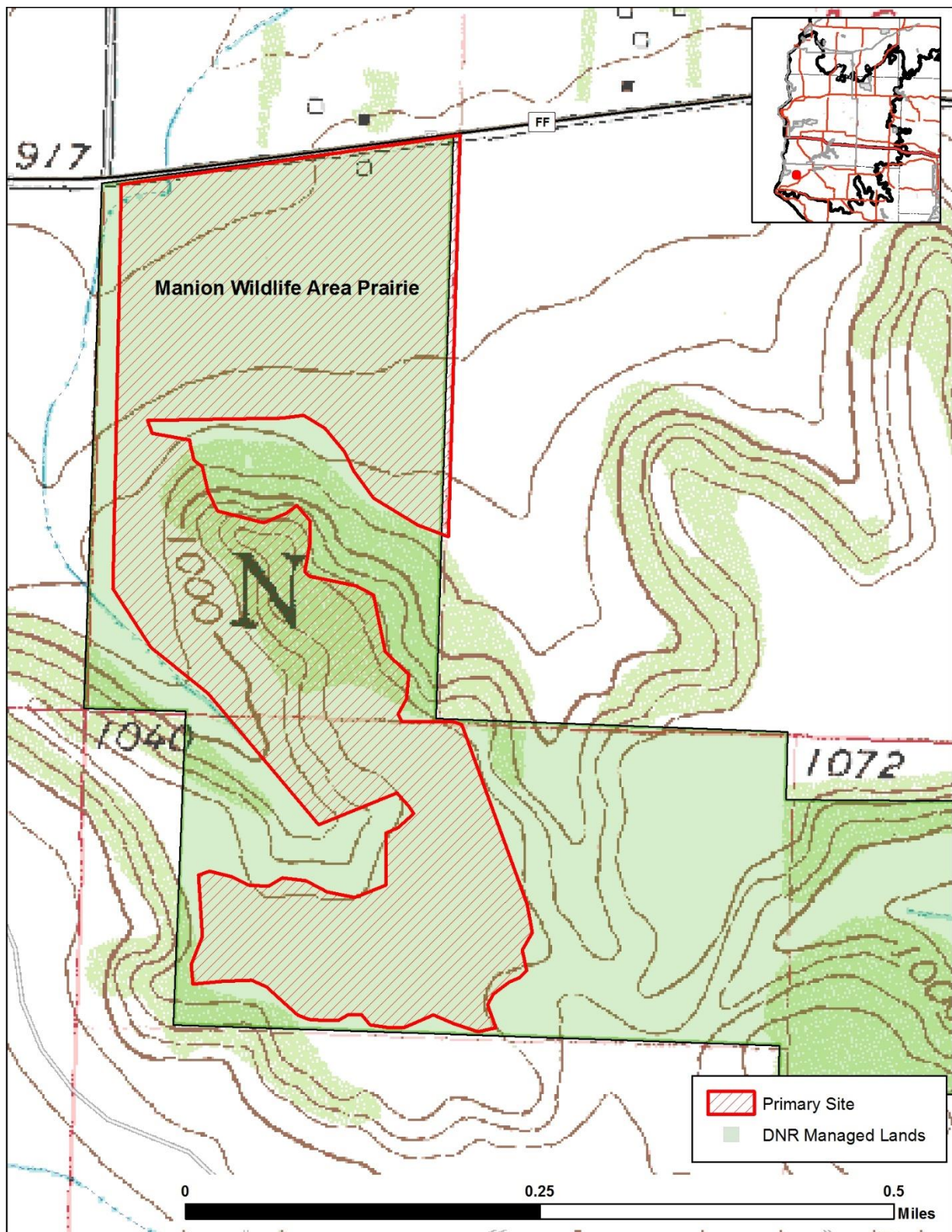
This site supports a small but high-quality oak opening surrounded by restored grassland on a till plain of sandy loam. Large open-grown bur oaks provide dappled shade over native dry prairie plants, including side-oats grama (*Bouteloua curtipendula*), little bluestem (*Schizachyrium scoparium*), plains muhly (*Muhlenbergia cuspidata*), Leonard's skullcap (*Scutellaria parvula* var. *missouriensis*), fringed puccoon (*Lithospermum incisum*), stiff goldenrod (*Solidago rigida*), purple prairie clover (*Dalea purpurea*), and violets (*Viola* spp.). The oak opening was likely grazed, and smooth brome (*Bromus inermis*) is abundant in areas. The flat areas below the oak opening were plowed but have been planted to tallgrass prairie and provide an important buffer around the remnant oak opening.

### **Significance of Site**

This site is important as an intact, actively managed example of a globally rare natural community, which supports an important population of a state endangered plant. Oak openings were formerly common in the Western Prairie Ecological Landscape, but few examples remain today. Perhaps the best opportunities for conservation of this natural community in the Western Prairie occur along the lower Kinnickinnic River, which Manion Wildlife Area is near. Although numerous rare species have been identified in prairies and oak openings along the lower Kinnickinnic River, very little land has been protected or is actively managed.

### **Management Considerations**

Manion Wildlife Area is managed to provide opportunities for public hunting, trapping, wildlife observation and other nature-based outdoor recreation. Management objectives aim to maintain an open grassland/oak savanna community through prescribed fire, mechanical and chemical control of woody species, and limited haying and grazing. The forested portions of the property are managed to perpetuate central hardwoods cover type to provide forested habitat for wildlife. Populations of invasive species are controlled or eliminated by cutting, pulling, burning, herbicide treatment and/or biocontrol. Management of the prairie should follow NHC Grassland Protocols to avoid adversely impacting the state endangered plant.



**WPEL04. Manion Wildlife Area Prairie Primary Site**



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## WPEL05. WILLOW RIVER – THREE LAKES GRASSLANDS

### ***Location***

Property: Willow River Wildlife Area  
Landtype Association: Emerald Prairie (222Md09), New Richmond Prairie (222Md07) and St. Croix Prairie (222Md06)  
Approximate Size: 968 acres

### ***Description of Site***

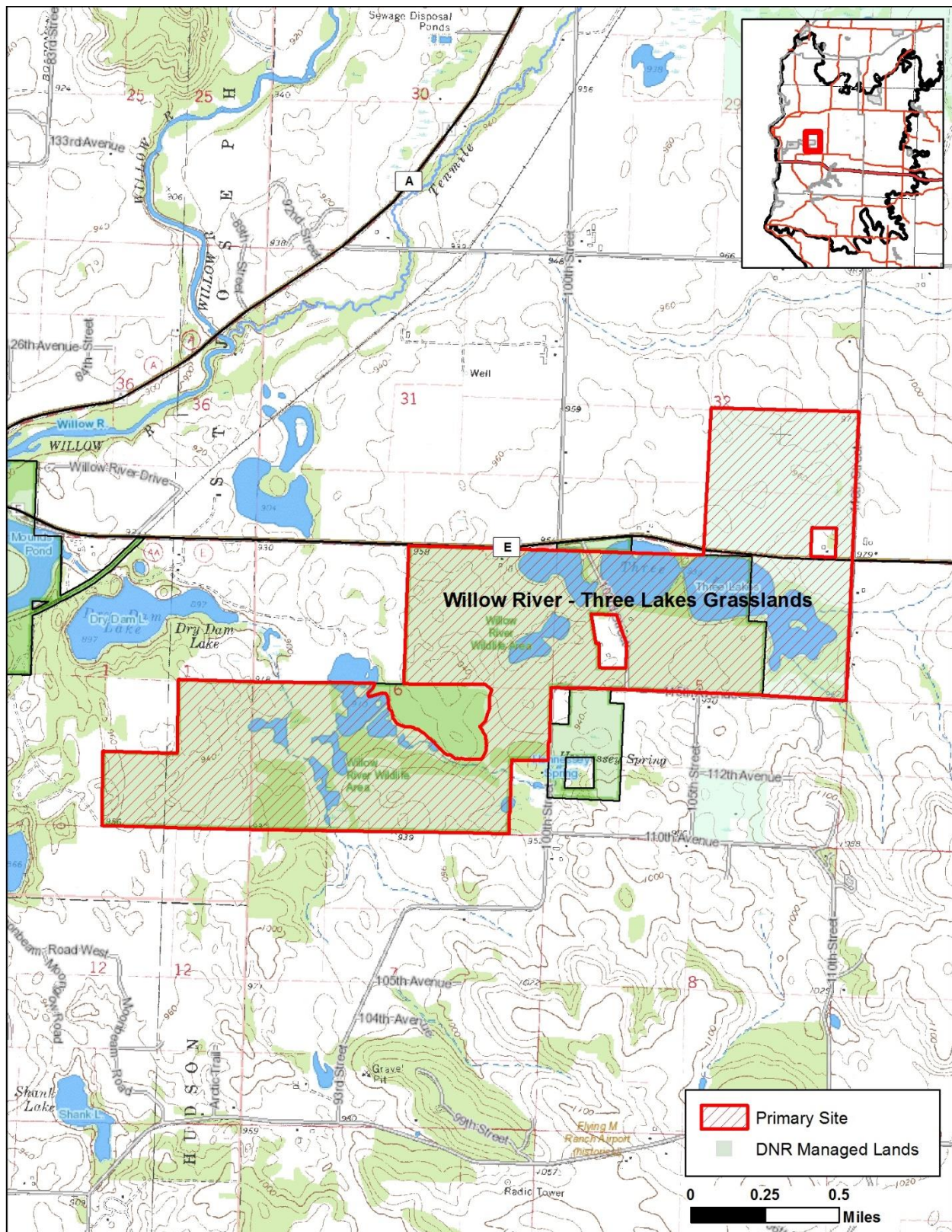
This large, rolling grassland complex is a matrix of restored prairie, remnant dry prairie knobs, small oak openings, and several shallow pothole lakes. The site is outwash plain with rolling terrain on the south portions and nearly level on the northern half. Soils are well drained silty, loam and sand over gravelly, sandy outwash. The pothole lakes are small hard-water seepage lakes with submerged and emergent aquatic vegetation, including wild rice. Between the potholes are open-grown oaks with some prairie plants persisting beneath them. The surrounding landscape supports a matrix of planted prairie dominated by warm season grasses within which scattered prairie remnants persist on dry or sandy knobs; these remnants were grazed but never plowed.

### ***Significance of Site***

This area was once part of the large Star Prairie complex that dominated much of St. Croix County prior to European settlement. Today the region has been designated as the Western Prairie Habitat Restoration Area, established in 1999 to permanently protect and restore a core of 20,000 acres of grassland, wetland, and oak savanna. The potential to provide substantially more grassland acres in this landscape make it one of the highest priority landscapes for grassland bird management in the state (Sample and Mossman 1997). Because of this, the area has been identified as a Grassland Bird Conservation Area (BCA), unique because this grassland landscape offers one of the few locations in the entire state with prairie potholes, more commonly found in Minnesota, Iowa, North Dakota, and South Dakota. The primary site falls within the BCA and currently provides excellent habitat for a full suite of successional grassland bird species (short grass, tall grass, shrubby grasslands), as well as water/open wetland birds and area sensitive species.

### ***Management Considerations***

The Willow River – Three Lakes Grasslands Primary Site includes the Willow River State Wildlife Area and an adjacent portion of the Three Lakes Waterfowl Production Area managed by the USFWS. While DNR jurisdiction is limited to state lands, the inclusion of adjacent partner lands highlights the benefits of jointly managing a larger habitat complex to meet mutual conservation goals. The Bird Conservation Area concept suggests viable bird populations require conservation efforts at a large, landscape level. Identifying and protecting a “core” area with a minimum of 2,000 acres is the starting point, surrounded by other open grass cover, crops, pasture, and old field. With that in mind, priority considerations for this primary site include minimizing wooded lands within or adjacent to the site and maintaining grass cover on the landscape and the continuum of successional stages. Rotating management spatially and temporally using a variety of management techniques (e.g., timber harvest, prescribed fire, mowing, grazing, and herbicide application) can benefit the greatest number of species and taxa groups by creating a variety of habitat structures. Development has been identified as a major threat in this landscape due to the proximity to the growing Twin Cities. Expanding grassland acreage is desirable.



**WPEL05. Willow River – Three Lakes Grasslands Primary Site**



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## WPEL06. ST. CROIX ISLANDS SNA AND FLOODPLAIN

### **Location**

Property: St. Croix Islands Wildlife Area  
Landtype Association: St. Croix Prairie (222Md06)  
Approximate Size: 829 acres

### **Description of Site**

[St. Croix Islands SNA](#) encompasses most of this primary site and features a diverse and extensive mosaic of running sloughs, backwater lakes, braided stream channels, stands of emergent aquatic vegetation, old-growth lowland forest, and the delta of the Apple River. Abundant flowing springs on the north and east banks provide exceptional habitat for mussels and darters in the east channels. The stands of emergent plants are extensive, and, depending on water depth, are dominated by arrowhead, river bulrush, softstem bulrush, common reed grass, and huge patches of prairie cord grass. The lowland forest is dominated by silver maple with a few individuals reaching 35 inches in diameter. Canopy associates include green ash, hackberry, and elm. The understory is variable but is often undeveloped after annual flooding and scouring. Also present is wet prairie containing cardinal flower, swamp milkweed, Joe-pye weed, jewelweed, water horehound, culver's root, obedience plant, monkey-flower, and great blue lobelia.

### **Significance of Site**

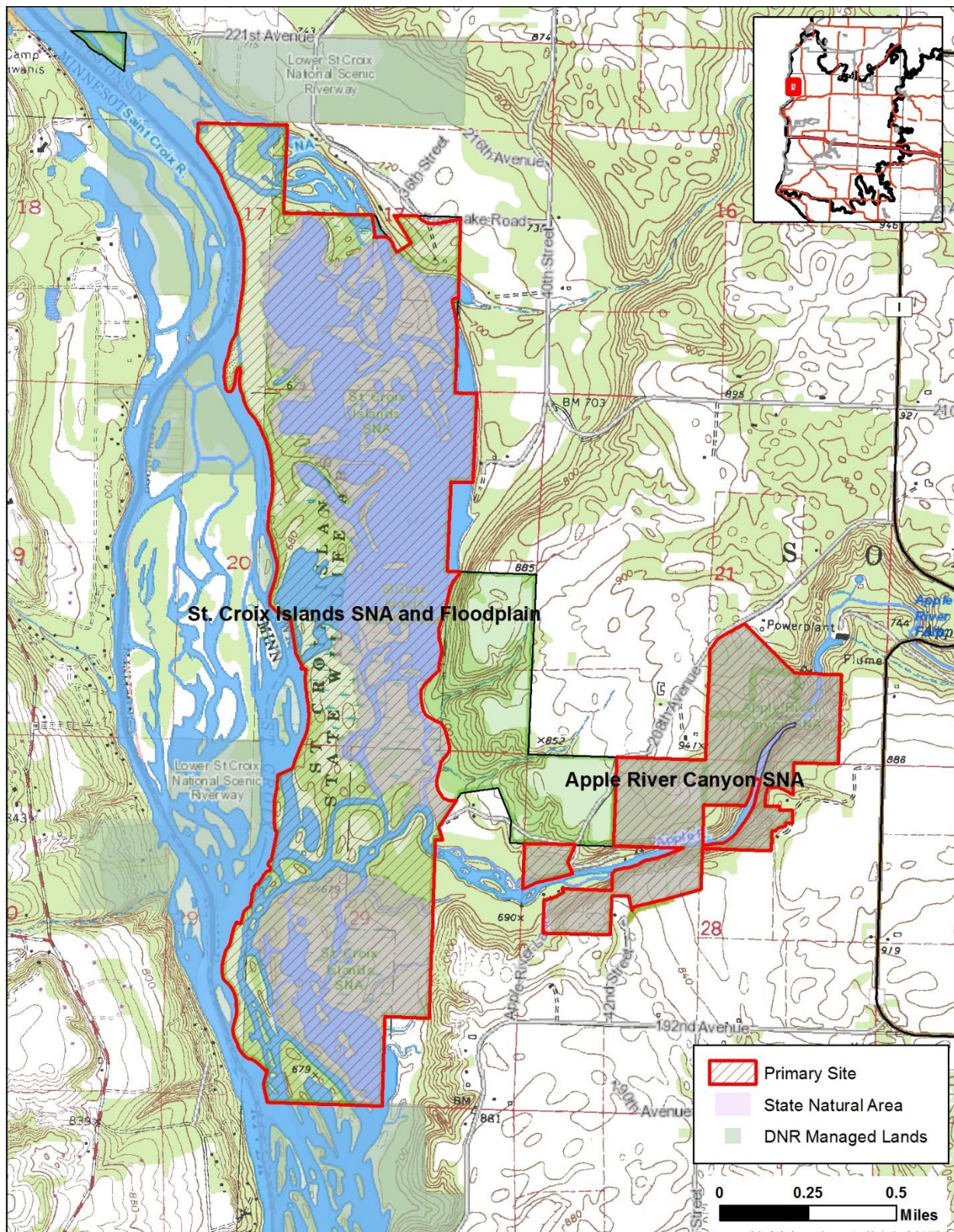
This site is located within the Lower St. Croix Uplands Conservation Opportunity Area, a COA of statewide significance featuring riparian communities containing floodplain forest and emergent marsh (WDNR 2008). The extensive nature of this site and diversity of habitats allows for an abundance of wildlife to flourish, particularly fish, mussels and birds. Fishes include greater redhorse, common shiner, pumpkinseed, speckled chub, and bass. The site is also located within the St. Croix Important Bird Area (IBA). Birds found on the site include great blue heron, bald eagle, marsh wren, and belted kingfisher. Numerous rare birds, fishes, and mussels are also known from the site. A rare reptile that is associated with open, sandy grasslands, meadows, and barrens is also known at this site. St. Croix Islands was designated a State Natural Area in 2010.

### **Management Considerations**

Located within the St. Croix Wildlife Area, the property is managed to provide opportunities for public hunting, trapping, wildlife observation and other nature-based outdoor recreation. Stated management objectives include maintaining the scenic riverway through passive timber management. Populations of invasive species are controlled or eliminated by cutting, pulling, burning, herbicide treatment and/or biocontrol.

The lowland forests of this primary site are vulnerable to the effects of emerald ash borer (*Agrilus planipennis*), especially where green ash comprises a large portion of the canopy. Large canopy gaps created as ashes die could lead to diminishment of important habitat for rare plants and animals and infestation of disturbance-loving invasives such as reed canary. It is important to note that removal of all ash as a stopgap measure against EAB is not recommended grass (WDNR 2010). Instead, proactive planting of resilient replacement trees such as swamp white oak may help fill gaps and limit such degradation.





**WPEL06. St. Croix Islands SNA and Floodplain Primary Site**

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## WPEL07. APPLE RIVER CANYON SNA

### **Location**

Property: Apple River Canyon SNA  
Landtype Association: St. Croix Prairie (222Md06)  
Approximate Size: 183 acres

### **Description of Site**

[Apple River Canyon SNA](#) features a deep (100-140 feet), narrow (150 feet) gorge along the Apple River about two miles upstream from its confluence with the St. Croix River. The Apple River is a shallow stream flanked by steep high cliffs on both sides. The vegetation is quite interesting due to the nearly east-west orientation of a segment of the gorge, creating north and south walls with contrasting sunlight, moisture, and temperature conditions. On the upland to the north is an oak forest; on the south-facing upper slope a strip of prairie grasses; on the south-facing cliffs a few lichens and mosses; on the lowest talus slope a floodplain forest; on north-facing talus a northern dry-mesic forest; on northern cliffs, cryptogams; and on the upper slope a narrow prairie.

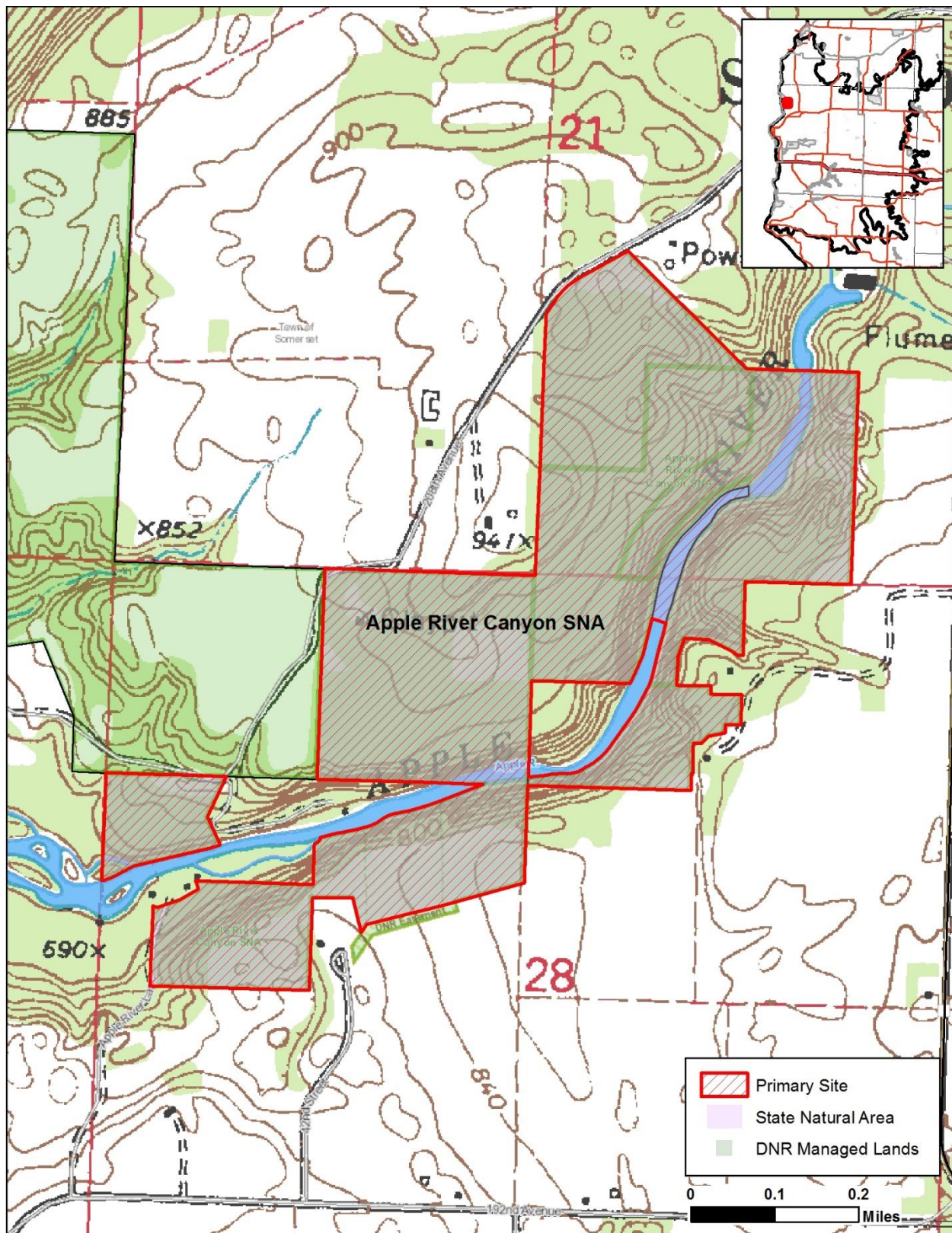
### **Significance of Site**

This site is located within the Lower St. Croix Uplands COA featuring communities of statewide significance including floodplain forest, emergent marsh, dry prairie, oak opening, dry cliff, moist cliff (WDNR 2008). The cliff communities are especially well-represented at Apple River Canyon. The site is also located within the St. Croix Important Bird Area (IBA), important for floodplain forest birds (heron rookeries, bald eagles, red-shouldered hawk, prothonotary warbler, Louisiana waterthrush), bluffs (numerous swallow species), and marshes provide nesting habitat for bitterns and rails. One state-threatened plant is known from this site and the site supports a large population of the uncommon Canada yew. Apple River Canyon was designated a State Natural Area in 1978.

### **Management Considerations**

Apple River Canyon SNA is managed as a reserve for southern dry forest, northern dry-mesic forest and dry prairie, as an aquatic reserve, and as an ecological reference area. In the dry and dry-mesic forest, the native dominant tree species (primarily oaks) are managed passively. However, understory manipulation and shrub control via harvest, brushing or fire may be needed to mimic natural disturbance patterns. The mostly passive canopy management and understory manipulation will determine the ecological characteristics of the site. In the prairie, vegetation is managed actively through tree/shrub control using tree harvest, brushing, and especially fire to mimic natural disturbance patterns. Occasional fire-tolerant oaks, hickories, and native shrubs such as hazelnut may be retained at low densities. The ecological characteristics of the site will primarily be shaped by an intensive fire management program. Across the entire site, other allowable activities include control of invasive plants and animals, maintenance of existing facilities and access to suppress fires. Salvage of trees after a major wind event is not considered compatible with management objectives.





WPEL07. Apple River Canyon SNA Primary Site

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## WPEL08. OSCEOLA BEDROCK GLADES SNA, SPRINGS AND FOREST

### **Location**

Property: Osceola Hatchery  
Landtype Association: Polk Basalt Moraines (212Qa03) and St. Croix Prairie (222Md06)  
Approximate Size: 62 acres

### **Description of Site**

[Osceola Bedrock Glades SNA](#) is a large complex of rocky basalt bedrock exposures. The site has a very distinctive glade flora and is exceptionally rich in ferns, mosses, and fungi. Vegetation is often dominated by low-growing herbs or if trees are present, they are thin, gnarly, and stunted. Patches of woodland with a canopy of oaks are present in the surrounding area. Below the glades and outside the current SNA lies a cold, fast-flowing stream fed by hardwater springs. On the opposite side of the stream, southwest of the glades and located on steep north- and east-facing slope lies a small but good-quality southern mesic forest dominated by sugar maple and basswood.

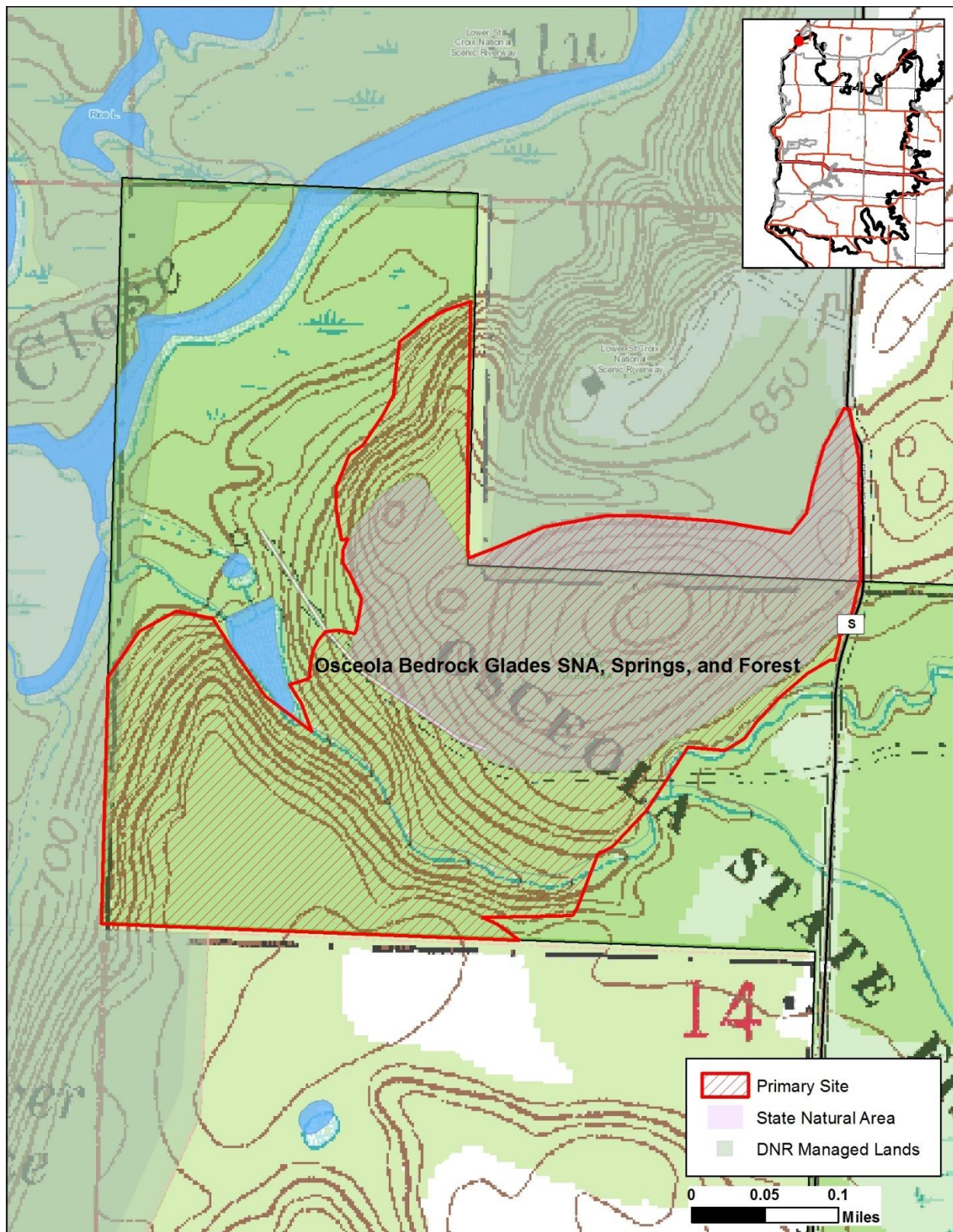
### **Significance of Site**

This site is one of only four well developed acid bedrock glades in Wisconsin. Bedrock glades are sparsely vegetated communities that develop on exposed relatively flat bedrock. Thus, these communities are rare because exposure of bedrock is itself a rare phenomenon in the state. Of note is the presence of a rare plant. The forest south of the glades also supports a rare plant and is notable for its quality as well as location in a landscape where prairies and savannas are more the norm. The site is located within the St. Croix IBA, important for floodplain forest birds (heron rookeries, bald eagles, red-shouldered hawk, prothonotary warbler, Louisiana waterthrush), bluffs (numerous swallow species), and marshes provide nesting habitat for bitterns and rails. Osceola Bedrock Glades is owned jointly by the WDNR and National Park Service and was designated a State Natural Area in 2002.

### **Management Considerations**

The objectives of the SNA are to manage the site as a reserve for bedrock glade, as a significant geological site, and as an ecological reference area. Natural processes and limited prescribed fire will determine the structure of the natural communities of this site. The native species on the bedrock glade (primarily oaks) are managed in a mostly passive manner. However, some thinning of the canopy, understory manipulation, and shrub control via brushing or occasional fire may be needed to mimic natural disturbance patterns. Other allowable activities across the entire site include control of invasive plants and animals and access to suppress wildfires. The bedrock glade is fragile, particularly the lichens that are found there. Since trampling of lichens presents a threat to this community, public use is limited to the trail or researchers with permits. A trail winds through the southern portion of the site, south of the creek, and is heavily used. Invasive species, especially common buckthorn, are well established just east of the primary site boundary and are a threat. Monitoring the trail for invasives and preventing spread of buckthorn into the SNA represent high-impact actions.





**WP08. Osceola Bedrock Glades SNA, Springs, and Forest Primary Site**

# Future Needs

This project was designed to provide a biotic inventory of the biodiversity values for the Western Prairie Ecological Landscape. Although the report should be considered adequate for master planning purposes, additional efforts could help to inform future adaptive management efforts, along with providing useful information regarding the natural communities and rare species of the WP EL.

## Invasive Species

- A comprehensive invasive species inventory and management plan is needed. This plan should include a monitoring strategy for detecting and rapidly responding to new invasive threats. Early detection and rapid response is much more cost-effective compared to waiting until invasives are well-established on the landscape.

## Natural Communities

- Conduct expanded surveys of St. Croix Islands to document high-quality floodplain forest, emergent marsh, floating-leaved marsh, and wet prairie.
- Conduct expanded surveys of lakes and pothole wetlands. Potential survey targets include aquatic macrophytes and water quality monitoring (including phosphorus and Chlorophyll-A), especially of lakes that are not monitored through other programs or projects.
- Monitor health and integrity of Osceola Bedrock Glade SNA, one of the best remaining acid bedrock glades in the state.
- Conduct management and monitoring of oak openings and southern dry-mesic forests to restore structure, groundlayer, and control buckthorn and other invasive species.
- Conduct surveys of partner lands for high-quality examples of natural communities (e.g., Lower St. Croix National Scenic Riverway, USFWS Waterfowl Production Areas, etc.).

## Rare Plants

- Continue to survey for rare plants not observed in the past 20 years.
- Monitor populations of rare Western Prairie specialists such as ground-plum and dotted blazing star, as well as populations of rare species at the northwest edge of their range, such as kitten-tails and prairie bush clover.
- Consider establishing new populations of federally threatened prairie bush clover in high quality, protected dry prairies with a commitment to long term management to reduce risk of statewide extirpation, as most extant populations in the state are limited to very small and vulnerable prairie remnants.

## Birds

- Continue monitoring grassland bird species such as Dickcissel, grasshopper sparrow, Henslow's sparrow, bobolink, eastern meadowlark, western meadowlark, and loggerhead shrike.
- Continue periodic surveys to monitor floodplain forest and emergent marsh species such as American bittern, great egret, red-shouldered hawk, and prothonotary warbler.

## Small Mammals

- Conduct small mammal surveys throughout the Western Prairie Ecological Landscape to inventory for common and rare prairie and grassland species (e.g., prairie vole, prairie deer mouse, etc.).

## Herptiles

- Conduct inventory of gophersnake (bullsnake), plains gartersnake and prairie skink in prairie habitat.
- Conduct inventory of timber rattlesnake in appropriate bluff habitat.
- Conduct egg mass surveys of ephemeral ponds in mesic forest associations and upland terraces of the St. Croix River.

## Invertebrates

- Conduct inventory for bees, especially the rusty-patched bumblebee (*Bombus affinis*).
- Conduct inventory for aquatic beetles in high-quality coldwater and coolwater streams.
- Conduct inventory for mussels along the Lower St. Croix River, targeting sites with historical records of 13 SGCNs. This area serves as a stronghold for several of Wisconsin's rarest mussel species, including the federally endangered Higgins eye, snuffbox, spectaclecase, and winged mapleleaf.



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